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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/583,408	06/20/2006	Gen Masuda	062690	3573

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EXAMINER	
PAK, HANNAH J	

ART UNIT	PAPER NUMBER
1796	

MAIL DATE	DELIVERY MODE
05/21/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/583,408	MASUDA ET AL.	
	Examiner	Art Unit	
	Hannah Pak	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 June 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08). Paper No(s)/Mail Date *10/26/2006 and 06/20/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

2 obviousness-type double patenting rejections are set forth below:

Double Patenting I

1. Claims 1-3 and 5-6 and are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1 and 5 of copending Application No. 10/583,410, hereinafter referred to as "U.S. '410," in view of Ito et al. (Machine Translation of JP 05-310808). Although the conflicting claims are not identical, they are not patentably distinct from each other.

Both the instant application and the U.S. '410 claim an inorganic-organic composite composition comprising an inorganic particle (includes inorganic hydroxide) having a polymer layer, which if formed by graft polymerization and has a nano-sized

thickness. The inorganic particles recited in both the instant application and the U.S. Appl. '410 has an average particle size of 1 nm-100 μm.

The U.S. '410 does not specifically mention their organic layer is formed in an ionic liquid-containing solvent as required by claim 1 of the instant application.

However, Ito et al. teach that the epoxy group content polymer can be made by polymerization of vinyl monomer system in an ionic liquid-containing solvent (Paragraphs 10-12). Ito et al. also teach that encapsulating the surface of inorganic particles, i.e. silica, would be industrially advantageous with the organic polymer which has high reactivity (Paragraph 6).

Given the above teachings, it would have been obvious to one of ordinary skill in the art to form the vinyl polymer layer in the ionic liquid containing solvent as taught by Ito et al. to obtain composites with desired properties.

This is a provisional obviousness-type double patenting rejection.

Double Patenting II

2. Claims are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 7, 10, 14 and 16 of copending Application No. 11/578,179, hereinafter referred to as "U.S. '179," in view of Ito et al. (Machine Translation of JP 05-310808). Although the conflicting claims are not identical, they are not patentably distinct from each other.

Both the instant application and the U.S. '179 claim a composition comprising an inorganic particle having a polymer layer, which if formed by graft polymerization and has a nano-sized thickness greater than 1 nm. The inorganic particles recited in both

the instant application and the U.S. Appl. '179 has an average particle size of 1 nm-100 μm. The inorganic particles recited in both the instant application and the U.S. Appl. '179 include one or more selected from the group consisting of alkaline earth metal carbonates, alkaline earth metal silicates, alkaline earth metal phosphates, alkaline earth metal sulfates, metal oxides, metal hydroxides, metal silicates, and metal carbonates.

The U.S. '179 does not specifically mention their organic layer is formed in an ionic liquid-containing solvent as required by claim 1 of the instant application.

However, Ito et al. teach that the epoxy group content polymer can be made by polymerization of vinyl monomer system in an ionic liquid-containing solvent (Paragraphs 10-12). Ito et al. also teach that encapsulating the surface of inorganic particles, i.e. silica, would be industrially advantageous with the organic polymer which has high reactivity (Paragraph 6).

Given the above teachings, it would have been obvious to one of ordinary skill in the art to form the vinyl polymer layer in the ionic liquid containing solvent as taught by Ito et al. to obtain composites with desired properties.

This is a provisional obviousness-type double patenting rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsubokawa et al. (Machine Translation of JP 05-295052) in view of Ito et al. (Machine Translation of JP 05-310808) and Nakajima et al. ("Protonic conducting organic/inorganic nanocomposite for polymer electrolyte membrane. Journal of Membrane Science, Pages 83-94, 2001).

Tsubokawa et al. disclose a composite comprising inorganic particles, such as silica (16 nm) and titanium oxide (120 nm), which bears a vinyl polymer layer on its surface (Paragraphs 9, 14 and 31). The vinyl polymer layer is formed by graft polymerization (Paragraph 14).

Tsubokawa et al. do not specifically mention that their vinyl polymer layer is formed in an ionic liquid-containing solvent. They also do not mention using an organic resin.

However, Ito et al. teach that the epoxy group content polymer can be made by polymerization of vinyl monomer system in an ionic liquid-containing solvent (Paragraphs 10-12). Ito et al. also teach that encapsulating the surface of inorganic particles, i.e. silica, would be industrially advantageous with the organic polymer which has high reactivity (Paragraph 6).

In addition, Nakajima et al. teach using organic resins in organic/inorganic nancomposites with desired thermal, electrical and mechanical properties (Pages 83-84).

Given the above teachings, it would have been obvious to one of ordinary skill in

the art to form the vinyl polymer layer in the ionic liquid containing solvent as taught by Ito et al. to obtain composites with desired properties. It would have been also obvious to employ the organic resin taught by Nakajima et al. to obtain inorganic/organic composites with advantageous properties useful for industrial applications.

As to claim 4, Tsubokawa et al. do not mention the specific thickness of their vinyl polymer layer. However, Tsubokawa et al. disclose when the amount of grafts of polymer increase on the surface of the inorganic particles to obtain outstanding effects (Paragraphs 6 and 50). Since the thickness of polymer affects the resulting inorganic particles, the thickness of polymer is the result-effective variable. Therefore, the determination of the optimum or workable thickness of the polymer to obtain desired properties is well within the skill of one ordinary in the art, see MPEP § 2144.05, IIB.

4. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over et al. Ito et al. (Machine Translation of JP 05-310808) in view of Nakajima et al. ("Protonic conducting organic/inorganic nanocomposite for polymer electrolyte membrane. Journal of Membrane Science, Pages 83-94, 2001).

Ito et al. disclose encapsulating the surface of inorganic particles, such as silica and alumina, with an epoxy group content polymer (Paragraphs 6-9). Ito et al. also disclose the inorganic particles having a particle diameter of 1 micrometer-1 cm (Paragraph 9), which overlaps with the claimed range, see MPEP § 2144.05. Ito et al. further disclose that the epoxy group content polymer can be made by ionic polymerization of vinyl monomer system in an ionic liquid-containing solvent

(Paragraphs 10-12). Ito et al. further disclose that encapsulating the surface of inorganic particles, i.e. silica, would be industrially advantageous with the organic polymer which has high reactivity (Paragraph 6).

Ito et al. do not specifically mention using an organic resin as recited in claim 1.

However, Nakajima et al. teach using organic resins in organic/inorganic nancomposites with desired thermal, electrical and mechanical properties (Pages 83-84).

Given the above teachings, it would have been obvious to one of ordinary skill in the art to employ the organic resin taught by Nakajima et al. to obtain inorganic/organic composites with advantageous properties useful for industrial applications.

Regarding claim 4, Ito et al. do not mention the specific thickness of their polymer. However, Ito et al. disclose as the polymerization progresses, the content of polymer solidifies on the inorganic particles, increasing the functionality of the inorganic particles (Paragraphs 4-5). Since the thickness of polymer affects the resulting inorganic particles, the thickness of polymer is the result-effective variable. Therefore, the determination of the optimum or workable thickness of the polymer to obtain desired properties is well within the skill of one ordinary in the art, see MPEP § 2144.05, IIB.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hannah Pak whose telephone number is (571) 270-

5456. The examiner can normally be reached on Monday - alternating Fridays (7:30 am - 5 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Hannah Pak
Examiner
Art Unit 1796

/HP/

/Vasu Jagannathan/
Supervisory Patent Examiner, Art Unit 1796